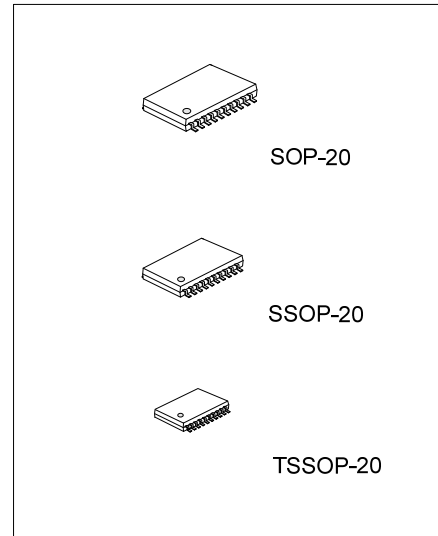


**U74LVC574****CMOS IC****OCTAL EDGE-TRIGGERED
D-TYPE FLIP-FLOPS
WITH 3-STATE OUTPUTS****DESCRIPTION**

The **U74LVC574** is a octal edge-triggered D-type flip-flop with 3-state outputs, and it has 8 channels.

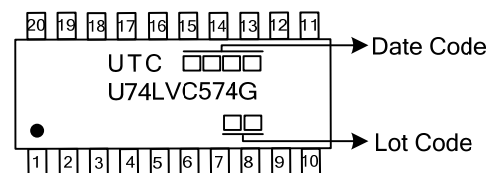
FEATURES

- * Operate from 1.65V to 3.6V
- * Max t_{pd} of 7ns at 3.3 V
- * Typical $V_{OL} < 0.8V$ at $V_{CC}=3.3V$, $T_a=25^{\circ}C$
- * Typical $V_{OH} > 2V$ at $V_{CC}=3.3V$, $T_a=25^{\circ}C$
- * Power off disables outputs, permitting live insertion

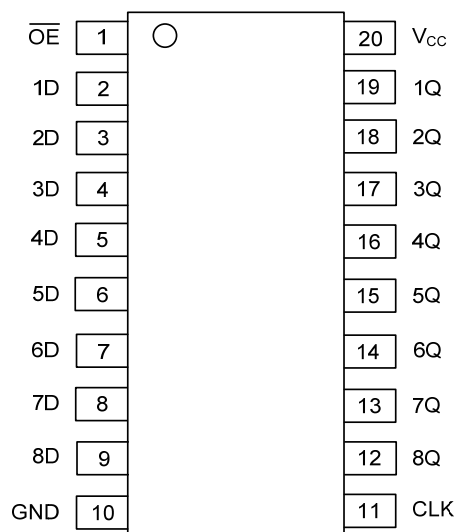
**ORDERING INFORMATION**

Ordering Number	Package	Packing
U74LVC574G-P20-R	TSSOP-20	Tape Reel
U74LVC574G-R20-R	SSOP-20	Tape Reel
U74LVC574G-S20-R	SOP-20	Tape Reel

U74LVC574G-R20-R	(1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel (2) P20: TSSOP-20, R20: SSOP-20, S20: SOP-20 (3) G: Halogen Free and Lead Free
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MARKING

PIN CONFIGURATION

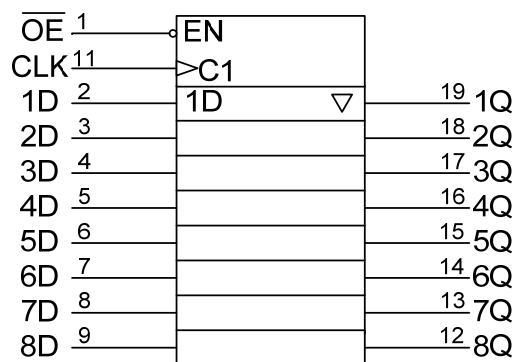


FUNCTION TABLE

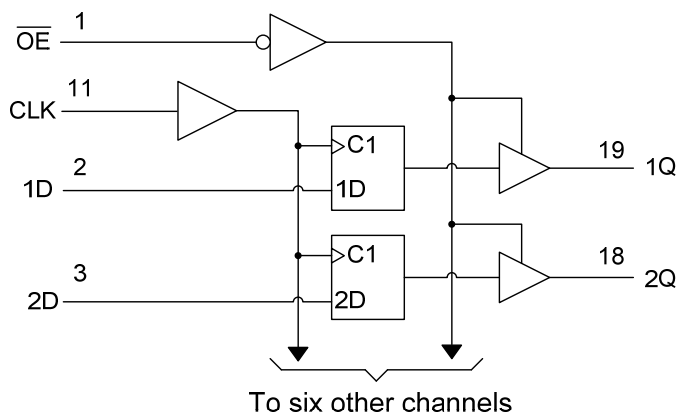
INPUTS(OE)	INPUTS(CLK)	INPUTS(D)	OUTPUT(Q)
L	↑	H	H
L	↑	L	L
L	L	X	Q0
H	X	X	Z

Note: H: HIGH voltage level; L: LOW voltage level.

LOGIC SYMBOL



LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{CC}	-0.5 ~ 6.5	V
Input Voltage	V _{IN}	-0.5 ~ 6.5	V
Output Voltage	V _{OUT}	-0.5 ~ 6.5 (Note 2) -0.5 ~ V _{CC} + 0.5 (Note 3)	V
V _{CC} or GND Current	I _{CC}	±100	mA
Output Current	I _{OUT}	±50	mA
Input Clamp Current	I _{IK}	-50	mA
Output Clamp Current	I _{OK}	-50	mA
Operating Temperature	T _{OPR}	-40 ~ + 85	°C
Storage Temperature	T _{STG}	-65 ~ + 150	°C

Note: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Voltage range applied to any output in the high-impedance or power-off state.

3. Voltage range applied to any output in the high or low state, and V_{CC} is provided in the recommended operating conditions table.

■ RECOMMENDED OPERATING CONDITIONS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V _{CC}	Operating	1.65		3.6	V
		Data retention only	1.5			
High-level Input Voltage	V _{IH}	V _{CC} =1.65V to 1.95V	0.65×V _{CC}			V
		V _{CC} =2.3V to 2.7V	1.7			
		V _{CC} =2.7V to 3.6V	2			
Low-level Input Voltage	V _{IL}	V _{CC} =1.65V to 1.95V			0.35×V _{CC}	V
		V _{CC} =2.3V to 2.7V			0.7	
		V _{CC} =2.7V to 3.6V			0.8	
Input Voltage	V _{IN}		0		5.5	V
Output Voltage	V _{OUT}	High or low state	0		V _{CC}	V
		3 state	0		5.5	
High-level Output Current	I _{OH}	V _{CC} =1.65V			-4	mA
		V _{CC} =2.3V			-8	
		V _{CC} =2.7V			-12	
		V _{CC} =3V			-24	
Low-level Output Current	I _{OL}	V _{CC} =1.65V			4	mA
		V _{CC} =2.3V			8	
		V _{CC} =2.7V			12	
		V _{CC} =3V			24	
Input Rise or Fall Times	t _R , t _F		0		6	ns/V

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	SOP-20	100	°C/W
	SSOP-20/TSSOP-20	115	°C/W

■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP (Note 1)	MAX	UNIT
Output Voltage High-Level	V_{OH}	$V_{CC}=1.65\sim 3.6V, I_{OH}=-100\mu A$	$V_{CC}-0.2$			V
		$V_{CC}=1.65V, I_{OH}=-4mA$	1.2			
		$V_{CC}=2.3V, I_{OH}=-8mA$	1.7			
		$V_{CC}=2.7V, I_{OH}=-12mA$	2.2			
		$V_{CC}=3V, I_{OH}=-12mA$	2.4			
		$V_{CC}=3V, I_{OH}=-24mA$	2.2			
Output Voltage Low-Level	V_{OL}	$V_{CC}=1.65\sim 3.6V, I_{OL}=100\mu A$			0.2	V
		$V_{CC}=1.65V, I_{OL}=4mA$			0.45	
		$V_{CC}=2.3V, I_{OL}=8mA$			0.7	
		$V_{CC}=2.7V, I_{OL}=12mA$			0.4	
		$V_{CC}=3V, I_{OL}=24mA$			0.55	
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=3.6V, V_{IN}=0$ to 5.5V			± 5	μA
Power OFF Leakage Current	I_{OFF}	$V_{CC}=0V, V_{IN}$ or $V_{OUT}=5.5V$			± 10	μA
Disable Output Leakage Current	I_{OZ}	$V_{CC}=3.6V, V_{OUT}=0$ to 5.5V			± 10	μA
Quiescent Supply Current	I_Q	$V_{CC}=3.6V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			10	μA
		$V_{CC}=3.6V, 3.6V \leq V_{IN} \leq 5.5V, I_{OUT}=0$ (Note 2)			10	μA
Additional Quiescent Supply Current	ΔI_Q	$V_{CC}=2.7\sim 3.6V$, One input at $V_{CC}-0.6V$, Other inputs at V_{CC} or GND			500	μA
Input Capacitance	C_i	$V_{CC}=3.3V, V_{IN}=V_{CC}$ or GND		4		pF
Output Capacitance	C_o	$V_{CC}=3.3V, V_{OUT}=V_{CC}$ or GND		5.5		pF

Note: 1. $V_{CC}=3.3V, T_A=25^\circ C$

2. This applies in the disabled state only.

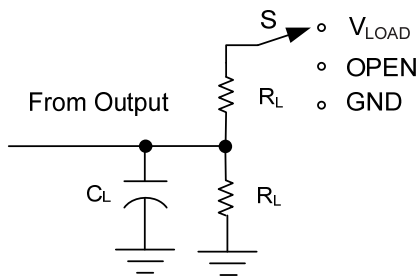
■ SWITCHING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (CLK) to output (Q)	t_{PLH}/t_{PHL}	$V_{CC}=2.7V$			8	ns
		$V_{CC}=3.3V \pm 0.3V$	2.2		7	
Output enable time from input ($\overline{OE}$) to output (Q)	t_{PZL}/t_{PZH}	$V_{CC}=2.7V$			8.5	ns
		$V_{CC}=3.3V \pm 0.3V$	1.5		7.5	
Output disable time from input ($\overline{OE}$) to output (Q)	t_{PLZ}/t_{PHZ}	$V_{CC}=2.7V$			7	ns
		$V_{CC}=3.3V \pm 0.3V$	1.7		6.4	
Maximum Clock Frequency	f_{MAX}	$V_{CC}=2.7V$	150			MHz
		$V_{CC}=3.3V \pm 0.3V$	150			
Pulse Width	t_W	$V_{CC}=2.7V$	3.3			ns
		$V_{CC}=3.3V \pm 0.3V$	3.3			
Setup Time	t_{SU}	$V_{CC}=2.7V$	2			ns
		$V_{CC}=3.3V \pm 0.3V$	2			
Hold Time	t_H	$V_{CC}=2.7V$	1.5			ns
		$V_{CC}=3.3V \pm 0.3V$	1.5			

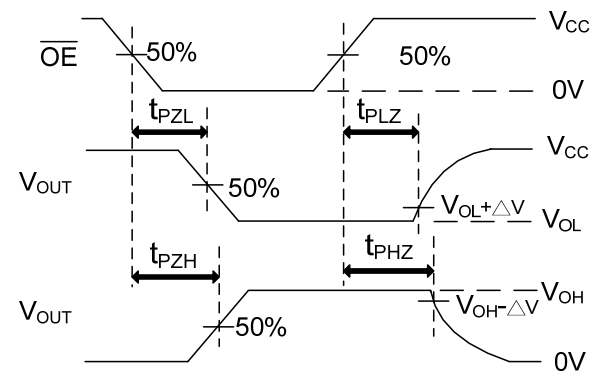
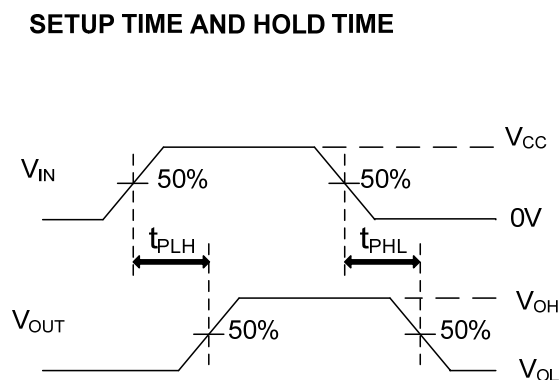
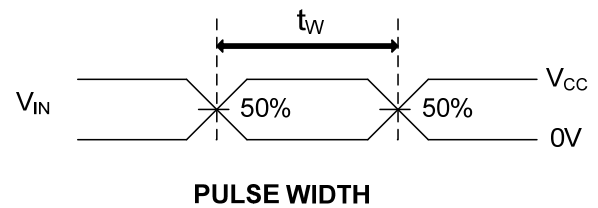
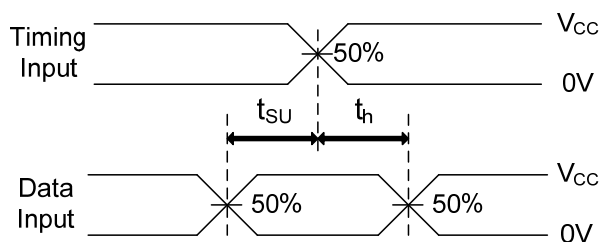
■ OPERATING CHARACTERISTICS($T_a=25^\circ C$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	Cpd	$OE=0, f=10MHz, V_{CC}=3.3V \pm 0.3V$		43		pF
		$OE=1, f=10MHz, V_{CC}=3.3V \pm 0.3V$		15		

■ TEST CIRCUIT AND WAVEFORMS



V_{CC}	V_{IN}	t_{PLZ}/t_{PZL} (V_{LOAD})	t_{PLH}/t_{PHL}	t_{PHZ}/t_{PZH}	C_L	R_L (Note 1)	ΔV
$1.8V \pm 0.15V$	V_{CC}	$2 \times V_{CC}$	OPEN	OPEN	30pF	1k Ω	0.15V
$2.5V \pm 0.2V$	V_{CC}	$2 \times V_{CC}$	OPEN	GND	30pF	500 Ω	0.15V
2.7V	2.7V	6V	OPEN	GND	50pF	500 Ω	0.3V
$3.3V \pm 0.3V$	2.7V	6V	OPEN	GND	50pF	500 Ω	0.3V



Note: 1. C_L includes probe and jig capacitance.

Note: 2. $PRR \leq 10MHz$, $Z_O = 50\Omega$, $t_{THL} \leq 2ns$, $t_{TLH} \leq 2ns$.

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